

The nuclear atom · supported focus

Supported focus · HL

Supported scope

- Supported HL focus. First assessment 2025; current brief acquired; full Chemistry guide not acquired. Remaining guide, assessment and practical requirements retain their recorded holds.
- State model conditions and distinguish fictional data from measurements.

Bonding · 1.1

Reasoning

A salt crystal conducts when dissolved but not when solid. The ions exist in both states; their ability to move changes. Start with a prediction. State the quantities or features you would compare, then decide what evidence could distinguish two explanations.

Bonding · 2.1

Reasoning

Ionic bonding is electrostatic attraction between oppositely charged ions. A covalent bond involves shared electrons. Metallic bonding involves attraction between positive metal ions and delocalized electrons . ionic bond: Attraction between oppositely charged ions; delocalized electron: An electron not confined to one atom or bond.

Bonding · 3.1

Reasoning

To explain a bulk property, name the structure, particles, forces and mobile charge carriers. Simple molecular substances can have strong covalent bonds inside molecules but weak attractions between molecules. Compare substances using evidence such as melting point, conductivity when solid and molten, and solubility. One property rarely proves a structure; use a pattern of evidence.

Bonding · 4.1

Reasoning

State the known values and their units. Choose the relation because its assumptions fit this case, then rearrange before substitution. Known: an element has atomic number 12 and mass number 24. Protons = 12; neutrons = mass number - atomic number = $24 - 12 = 12$. A $2+$ ion has electrons = $12 - 2 = 10$. Charge changes electron count, not the nucleus.

Bonding · 4.2

Reasoning

An atom has atomic number 17 and mass number 35. Find its number of neutrons.

Use the same sequence: known quantities $\rightarrow$ model $\rightarrow$ relation $\rightarrow$ substitution $\rightarrow$ unit and interpretation.

Bonding · 5.1

Reasoning

Melting a simple molecular substance usually overcomes intermolecular attractions; it does not require breaking all covalent bonds within each molecule. Return to the original observation. Explain what the result supports, which conditions it assumes, and one way to test a competing explanation.

Bonding · 5.2

Reasoning

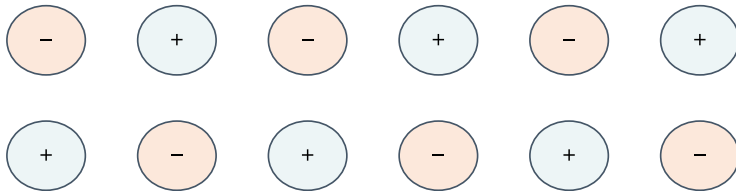
All covalent substances have low melting points. This claim is false: Melting a simple molecular substance usually overcomes intermolecular attractions; it does not require breaking all covalent bonds within each molecule.

Bonding · 5.3

Reasoning

Particles, bonding and bulk properties: To explain a bulk property, name the structure, particles, forces and mobile charge carriers. Simple molecular substances can have strong covalent bonds inside molecules but weak attractions between molecules.

Bonding · diagram



Alternating charges in an ionic lattice

- Original teaching diagram: Particles, bonding and bulk properties
- Use the labels and the stated model together.

Bonding · original transfer

Your turn

An atom has $Z=12$, $A=25$ and forms a $2+$ ion. State protons, neutrons and electrons before/after ion formation. What changes in an isotope instead?

Bonding · transfer reasoning

Method and interpretation

12 protons, 13 neutrons; electrons 12 then 10. Ion formation changes electrons. An isotope has the same Z but a different neutron count; it need not have a different charge.

Check yourself

- Explain ionic bond using the stated model.
- Explain delocalized electron using the stated model.
- Change one value in the original transfer; explain which assumption still matters.